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fence of his country would no doubt excite him to noble daring, has been known to occasion an incurable longing for a return to his country: such a sympathy might be directed to better and more patriotic purposes than that of hiring him to fight the battles of others. The effect of the bagpipes in rallying Frazer's regiment at Quebec, in the victory gained by Wolfe over the French, has been recorded in the anecdotes of that battle; and the inspiring airs of the wounded piper, in the glorious victory of Vimiera, is a fact too recent to require repetition. Would that the Scotch General Dalrymple had felt the electric inspiration of the *Highland* piper and his *Pibrach!*

Pennant derives the Irish pipes from a period of very remote antiquity, and the observation of that most indefatigable antiquary is confirmed by the early testimony of Aristides Quintilianus. The compass of the Highland bagpipe is confined to nine notes, while that of the Irish extends to more than two octaves. The modesty of our blind mechanic, as we have said before, has prevented him from enlarging on several points which we shall here beg leave to notice, illustrative of his ingenuity as an improver of this instrument. In this respect, indeed, he deserves the character of a discoverer, as his additions to the Irish pipes will do away many of their imperfections, and he has had the great merit of adapting them with simplicity, for the management of the instrument is nearly as easy as formerly. To the chanter he has added keys, by which some flats and sharps, not capable of being before expressed on the instrument, are now produced with ease. He has also added E *in alt.* being one note above the original compass of the instrument. Two additional notes are given by him to the Organ-stop, and some of its notes are now capable of being varied from naturals to sharps, according to the key on which the tune is played.

The basses or *drones*, as they are commonly called, formerly only in correct tune when playing on some particular keys, are now constructed so that their notes can be varied as the key varies on which the tune is played.

There is also another alteration worthy of notice; by the addition of two large keys, managed with the wrist, a part of the basses, or all of them, can be stopped and opened at pleasure. The particulars of these most ingenious alterations would require terms too technical to be introduced here, but they shall be the subject of a future number.

In short, this blind mechanic is as yet unequalled, for elegance of workmanship and perfection of scale, in one of our favourite national instruments. From a rude block of ebony, a fragment of an elephant's tooth, and a piece of silver....having first formed his lathe and his tools, he shapes and bores the complicated tubes, graduates the ventages, adapts the keys, and forms an instrument of perfect external finish and beauty "that discourses most eloquent music," capable of expressing the finest movements in melody, and by no means deficient in harmony: and all this by the exquisite sensibility of the *touch*, for he is stone blind, and quite incapable of distinguishing the black colour of ebony from the white of ivory. Under poverty therefore and physical privation of the most overwhelming kind, he has gradually brought his mechanical powers to this pitch of comparative perfection! What an incentive to perseverance under difficulties much less insuperable! It is hoped that the readers of this article will be induced to inquire into the actual authenticity of the statement, and be led to encourage such extraordinary application and ingenuity. W.

Some Account of Don Joseph Celestine Mutis, *Chief of the Spanish Botanical Expedition to Santafé de Bogotá, in South America....Translated from the Annals of the Museum of Natural History at Paris.*

THE naturalists of the day may not unaptly be divided into three classes: the first consisting of such as happily unite the qualifications of actually observing the spirit of their studies, and of recording in a perspicuous manner the progress of their labours; the second, of those who, unfortunately for the public, observe without writing; and the third of those who

as unfortunately for themselves, write without observing. It is obvious that none claim in a higher degree the attention of the contemporary biographer than those of the second class, whose names, unless perpetuated by their collateral merits, are scarcely ever seen to grace the pages of the history of that science the boundaries of which they are continually extending. It is upon this ground that we deem it our duty to lay before our readers a brief sketch of the Life of Don Joseph Celestine Mutis, a name which from being so often honourably mentioned by Linnæus and others of his correspondents, has become familiar to the generality of students in natural history, though most of them are entire strangers to the particulars of the life of the veteran naturalist himself: nor should we have been enabled to give the following account of him, but for the kindness of Don Pedro d'Oribe y Vargas, well known to the English reader, by an ingenious memoir on the remarkable efficacy of certain plants against the bite of serpents (Tilloch's Philosophical Magazine, vol. xii. p. 36. seq.) and who, as the pupil and friend of Mutis, is best qualified to furnish the materials for his life.

Don Joseph Celestine Mutis was born at Cadiz, in 1734, of an Italian father and a Spanish mother. His parents, with a view of profiting by the early inclination he discovered for the sciences, intended him for the profession of medicine: and accordingly placed him under the tuition of Don Pedro Virgilio, a surgeon of eminence, then a professor in the military academy of Cadiz, and honourably mentioned by Loefling in his Letters to Linnæus. Here he remained until 1755, when he removed to Seville, for matriculation in the university of that city. In the mean while the declining health of Ferdinand VI. of Spain, and of his consort, having caused all the most celebrated medical practitioners of the kingdom to be summoned to the court at Madrid, Pedro Virgilio was of the number; and he, from amongst the rest of his pupils, selected Mutis as the companion of his journey. In this capital our young adventurer soon acquired many friends, and not a small degree of reputation; but amongst his most eminent patrons was Don Ricardo Wall, then minister of state, by whom a pension from the king was proposed to Mutis, for the purpose of enabling him to travel. Owing, however, to the death of Ferdinand, and a consequent change in the ministry, which took place soon after, this plan soon fell to the ground. In the mean while his skill in anatomy and physiology had procured for him the professorial chair of the former science, which had been lately occupied by Don Martin Martinez, a man of considerable abilities.

About this period a zeal for the sciences had caused, as it were, a universal ferment throughout the whole peninsula of spain. The fame of Hermann Boerhaave had drawn many of the Spanish youth from their country to Holland, for the sake of attending the lectures of that celebrated physician: these on their return brought back and diffused various branches of knowledge, perfectly new to that part of Europe, such as mathematics, botany, and many other branches of science: while at the same time the voyage undertaken by the French academicians to Peru, to whom Don Jorge Juan and Don Antonio de Ulloa, two young Spaniards, were associated, had excited an extraordinary degree of emulation in such of their young countrymen as were desirous of placing themselves on a level with other nations in the various departments of literature and science. This epocha might almost be termed that of the revival of the sciences in Spain. Mutis, together with several of his literary friends, zealous for the honour of their country, and foremost among the promoters of knowledge, had for some time been occupied with a project of founding an academy of sciences at Madrid, when the Marquis de la Vega, being appointed viceroy of the kingdom of New Granada, solicited the subject of this memoir to accompany him to that country in the capacity of body-physician. The restlessness of youth, (Mutis not being then more than twenty-six years of age,) the desire of seeing a country already rendered doubly interesting by being that fixed on for the measurement of the meridian by the French

academicians, joined to the prospect of acquiring a fortune, with which he might enjoy himself on his return to Spain, induced him to accept the proposal, and to embark for America with the Viceroy in 1760.

Previous to his leaving Cadiz he became acquainted with the Swedish consul at that place, a man of science, who supplied him with the earliest productions of Linnæus, then already near the zenith of his celebrity, and also recommended him to enter into an epistolary correspondence with his great countryman; of which opportunity we may readily suppose that Mutis eagerly availed himself.

On his arrival at Santafé de Bogotá, the capital of the kingdom of New Granada, Mutis found that the state of science there was even more deplorable than he had supposed; fanaticism and prejudice in every shape had full and uncontrolled dominion, and a junto of dull and ignorant monks disgraced the chairs of the university, from whence knowledge and light could in such a situation be alone expected to emanate. It is obvious that, under such circumstances, this new residence could be little less than a desert to an active mind like his; but this very activity suggested a plan to him, which, should it succeed, could not fail of rendering his stay highly beneficial: he proposed to excite among the students of the university a desire for useful knowledge, to introduce sciences as yet unheard of in these regions, and thus in a manner to create a new generation congenial to his mind. Aware that this science forms the basis of most of the other branches of human knowledge, he asked permission from the viceroy to give a course of lectures on the mathematics; which was readily granted by his patron. He accordingly began his lectures in the college del Rosario to a crowded audience; and whether owing to the novelty of the subject, to the interesting and perspicuous manner in which he treated it, to the bent of mind of his hearers, by no means naturally averse from light, or to all these circumstances combined, mathematics soon became the favourite study of the American youth, and Mutis the object of their universal admiration. But not so with the old professors, and particularly the whole race of monks....this pest of Spain. Impatient of that light which exposed their ignorance to open view, and apprehensive that the success of Mutis would ultimately prove the death-blow to their importance and influence, they rose up with a fury peculiar to themselves against the new doctrine and its professor. To bring him into discredit among the more religious part of the community, they insinuated that the science of mathematics was a magical, a divinatory, a diabolical art, unwarranted by law, and prohibited by religion; that it was impossible for man to measure the distance of remote objects from a given point, such as the sun and moon from the earth, and that the prediction of eclipses and other phænomena of nature could only be the result of a secret pact with the devil

These and many other calumnies of a similar description had a limited effect, in so far as they induced many a religious person, who did not wish to be the father of a necromancer, to restrain his son from attending those profane lectures, and as they exposed Mutis to the fangs of the inquisition; but the injury he sustained in the former case was immaterial, and from the latter he was fortunately shielded by the decided patronage of the viceroy. Thus, in spite of the machinations of his enemies, Mutis procured himself a strong party among the less prejudiced portion of the community, which entirely silenced his ignorant opponents; and his triumph was complete, when the professorial chair of philosophy, mathematics, and natural history, finally received the sanction of the Spanish government.

We ought not to consider Mutis merely in the light of a naturalist animated with a zeal for those sciences he professes, as many of his actions and exertions have proved him to be a man who possesses a heartfelt interest in the prosperity of the country he inhabits. As such, he always (perhaps erroneously) fostered the idea that the gold, and especially the silver-mines are the principal source of the wealth, and their contents the staple commodity, of Mexico and Peru. Gold is found, in the viceroyalty of Santafé, almost

exclusively in the sand of the rivers, or in the low parts of the valleys that were formerly inundated, whither this metal has obviously been washed from the sides of the mountains. The collecting of the dispersed grains of this metal requires no other talent than that of patience, and is easily performed by the natives; but it is otherwise with the silver, the management of which, as being mineralised with other substances, and lying in regular veins within the bowels of the Cordilleras, requires ingenuity, labour, and no inconsiderable expenditure of money. Mutis wished to render silver a new object of national wealth; and finding in the accounts of the first conquest of New Granada many particulars relative to the incomparable riches of some silver mines that were lost by negligence, or want of skill in the working, Mutis directed his attention to *la Montuosa* and *Vetas*, in the districts of Pampelona and Giron, the most celebrated of them. In these he laboriously employed several years with unparalleled patience, and considerable pecuniary expense: but the enterprise finally proved abortive, and the only advantage he derived from it was the acquisition of an extensive knowledge of the objects of natural history that were to be met with in those districts, and of many interesting geological facts, which, should he ever be disposed to publish them, would throw great light on the formation of the Cordilleras, and the gradual changes they have undergone in the course of ages. Here too it was that he discovered his *Psychotria emetica*, of which he sent the description to Linnæus.

The great loss which our naturalist sustained in working the mines of Montuosa, could not but render him an object of universal interest, except to persons possessed of such ungenerous minds as are incapable of sympathizing with a good man labouring under the double load of a ruined fortune and blighted expectations. The viceroy his friend and protector, in order to furnish him with an opportunity of retrieving his losses, proposed to give him some civil employment, or the office of a magistrate; but Mutis, though in every respect qualified for either task, declined the offer, as little congenial to his inclinations.*

Soon after this period Mutis embraced the clerical profession, and, having spent some months in the capital, resolved to try his fortune once more in another silver mine; for which purpose he pitched upon that of *Sapo*, at the foot of the western ridge of mountains of the government of Maraquita, not far distant from the town called Ybagué. The spot which he chose for his ordinary residence was truly romantic. His dwelling-house stood upon an acclivity commanding the most enchanting prospects over that extensive valley, through which the river Luisa winds its devious course: the groves of palm trees, and all the rural scenery in the vale below, surrounded by a chain of hills that gradually rise one above the other, till they are lost among the clouds, afford a spectacle at once pleasing and majestic. In this sequestered seat, our philosopher enjoyed the benefit of a pure and salutary air, equally remote in its temperature from the two extremes of the summits of the mountains and the valley beneath. Here he divided his time between the superintendance of the mines, and inquiries into the various branches of science; here he made his interesting observations on the natural history and economy of the ant: but botany formed the peculiar object of his indefatigable researches. Nor was he, whilst thus occupied, forgetful of the interest of others: he assisted by his medical advice, not only those who lived in his immediate neighbourhood, but from many distant places people flocked to consult him; and the success of his prescriptions was so considerable, that he was soon looked upon as the tutelar deity of the district.

His sanguine expectations respecting the mines of Sapo proving equally a-

* The viceroy conversing with Mutis on the *gobiernos y corrigimientos politicos*..." Political governments and corrections" that he intended to confer upon him, the latter replied: *que no pensaba tener otro gobierno que el de si mismo, ni otro corrigimiento que el de sus pasiones.* "He wished to maintain no government but that of himself, and no other correction than that of his passions."

bortive with those which he had formed at Montuosa, Mutis now found it expedient to relinquish this object entirely. Probably it had been a collateral motive with him, by these speculations, to realize a fortune that would secure to him an independence on his return to Europe; but this motive must now have ceased to exist, as the excellent climate of the country which he inhabited, the general esteem in which he was held by its inhabitants, the ascendency he had acquired over their minds by his talents and virtues, all induced him to settle for ever in the kingdom of Santafé, and, retired from the capital, and from the bustle of the world, to spend the remainder of his life in the delicious mansion of Sapo.

At the latter place he lived for several years, unknown to his countrymen in Europe, till, in the year 1778, the archbishop Don Antonio Caballeroy Gorgora arrived in Santafe; an event that caused the whole body of the clergy to send in their congratulatory letters to their chief diocesan; among the number was that of Mutis; and his letter, probably as different from the rest in phraseology and sentiment, as the qualifications of its writer were from those of his brethren, excited the particular attention of the archbishop, whose penetrating eye soon discovered the genius that had dictated it. Having learned the condition of the writer, he resolved to pay him a visit in person, and accordingly the next year undertook a journey to Sapo, where he only remained a few days; but this proved a time sufficient for him to be satisfied of the genius and the uncommon extent of the acquirements of Mutis, which for want of encouragement were lost to Spain and to Europe in general. It was owing to the friendship that subsisted between the archbishop and the minister for the affairs of India, that the latter learned to appreciate the merits of Mutis, and procured for him, in addition to a present of 8000 *pesos duros* for arranging his affairs, an annual pension of 2000 *pesos duros* from the king, which would enable Mutis wholly to dedicate his hours to his favourite study, that of botany. The king also conferred upon him the title of botanist and astronomer royal, and appointed him director of a botanical expedition undertaken with a view of ascertaining the vegetable riches of the kingdom of New Granada. The superintendants of the botanic garden of Madrid opened a correspondence with him; and he now almost for the first time became as well known by this intercourse to his countrymen, as he had long before been to the foreign literati by his epistolatory intercourse with several celebrated naturalists, and particularly with Linnæus, who affixed his name to a plant, and caused him to be elected a member of the academies of Upsal and Stockholm.

From that period the king, and Jose de Galvez, one of his ministers, interested themselves so much in favour of the American philosopher, that the archbishop, who was appointed viceroy of Santafé in 1783, was directed to grant to him a further pension of 2000 *pesos fuertos* per annum, for the purpose of defraying the extra expenditure he might be put to as director of the expedition which was about to be undertaken: he also received orders to point out the books, instruments, and other things requisite: which were forthwith procured from the most eminent artists in London and Paris.

Mutis having chosen for his assistants Don Eloy de Valenzuela, a very intelligent creole, and some ingenious draughtsmen, set out in 1783 on his tour through the kingdom: but owing to the zeal with which they commenced their undertaking, the health of his companion was so much impaired as to oblige him to return to Santafé, and to leave Mutis to prosecute his labours by himself; who had now established his head quarters in the town of Mariquita. Here he dedicated a considerable portion of his time and attention to the examination of the different species of *Cinchona* which are found in that district: he succeeded in discovering, and in scientifically distinguishing, the seven species, of which he communicated the description in a periodical paper of Santafé, and on which also M. Zea, his pupil, has published an interesting memoir in the

Anales de Ciencias naturales. He likewise caused to be transplanted to Mariquita, in order to examine its quality, a quantity of the stems of the *Canella*, found in the woods of Andaquies, and devoted a great part of his time to the culture of the *Indigofera tinctoria*, with a view to make his countrymen more thoroughly acquainted with the commercial advantages they might derive from so useful a plant. Here he is also said to have discovered the true nutmeg, called *Otova* in the language of that country.

The deleterious climate of Mariquita, and the zeal with which he gave himself up to the object of the expedition, brought on a nervous complaint, that prevented him in a great measure from continuing to collect materials for his *Flora Bogotensis*. The king, however, being informed of this circumstance, and desirous that the indisposition of this naturalist might not deprive the world of the results of his observations, ordered him to nominate several persons who might execute, under his direction, what he was precluded from performing himself, and also to establish a botanic garden at Santafé. In pursuance of this order, Mutis repaired to the capital, where he took for his associate Don Francisco Zea, a native of the province of Antioquia, whom we have before noticed as his pupil, and also wrote to Quito for an additional number of draughtsmen. In 1791 Mutis employed twelve painters in making coloured drawings from nature, of the plants, with the the necessary dissections of the flowers and fruit; a task which they are said to have executed with all that exactness and delicacy of which this branch of painting is susceptible. We understand that some time ago above four thousand drawings of this kind were finished.

In order to prevent any delay in the progress of the expedition, Mutis set about arranging his descriptions at Santafé, whilst Zea travelled in different parts to collect specimens and seeds. An unforeseen accident, however, put a sudden stop to their activity: Zea, on account of an imputed conspiracy against government, was arrested in the midst of his botanical pursuits, conveyed to Santafé, and there confined in prison till 1797; when, with other innocent victims of that country, he was brought over to Spain to be tried. Their innocence was, however, not difficult to be proved; they were honourably acquitted, and reinstated in their former functions. Mutis availed himself of this opportunity to obtain leave from Madrid for M. Zea, to undertake a journey to Paris, in order to consult the botanists of that city in various matters respecting the Flora of Bogota, and to perfect himself in the study of Jussieu's classification of plants. This request was granted; Zea made a stay of some years in France, and, having attained his end, returned to Spain in 1801. We are ignorant whether he immediately visited his native country; but we have recently learned that he is appointed successor to the late Cavanilles, as professor of botany and director of the botanic garden of Madrid.....an office which we have no doubt he will fill to the greatest advantage of the science.

What has been said may be sufficient as a sketch of the life of a man who, having during a long series of years extended his studies to so many branches of knowledge, has treasured up a number of observations relative to the natural and political history of New Granada, not to be acquired without a long continued application, and an ingenuity like his. As a botanist, Mutis is well known throughout Europe; and as a statesman, the viceroys have made it a rule to consult him in all important and arduous undertakings; and what is very rare in those regions, his advice has always been in favour of the natives of the kingdom, who therefore love and respect him as one of their most active benefactors.

Annals of Botany